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CANARY SEED: SITUATION AND OUTLOOK (with an overview of Canadian spice crops production)

Canada, mainly the province of Saskatchewan, accounts for about 80% of world production and about 90% of world exports of canary seed. The value of Canadian canary seed exports averaged about $80 million during the past five years. For 2007-2008, Canadian canary seed production is forecast to increase from 2006-2007, but supply is expected to decrease as sharply lower carry-in stocks more than offset the increase in production. Therefore, the average price is forecast to increase. Over the longer term, Canario, a new type of canary seed developed in Canada, offers new opportunities for food and industrial uses, and is expected to result in increased demand. This issue of the *Bi-weekly Bulletin* examines the situation and outlook for canary seed and also includes an overview of the production of spice crops in Canada.

WORLD

Production and Trade

During the past 10 years, world canary seed production ranged from a low of 149,000 tonnes (t) in 2001-2002 to a high of 349,000 t in 2004-2005. Annual production was extremely variable, but the variability was mainly in Canada.

About 65% of the world's canary seed production is traded. Canary seed exports have been relatively stable during the past ten years, averaging about 210,000 t per year. Although normally there is little substitution of other birdseed for canary seed, substitution occurs in years when the canary seed price is high compared to alternatives, such as millet. The substitution occurs mainly in wild bird seed mixtures.

In 2006, world exports were 221,000 t. However, about 10% of the exports were re-exported to third countries. Canada dominates world exports, accounting for about 90% of the exports in 2003, if re-exports are excluded. Argentina and Hungary are the only other significant exporters of canary seed, excluding re-exporters such as the United States (US), Belgium and Netherlands. Imports are much more widely distributed than exports, with the top five importing countries (Mexico, Brazil, Belgium, Spain and US) accounting for about 65% of imports.

WORLD: CANARY SEED SUPPLY AND DISPOSITION

	2003 -2004	2004 -2005	2005 -2006	2006 -2007	2007 -2008f
Harvested Area (kha)	290	355	225	150	195
Average Yields (t/ha)	0.91	0.98	1.19	1.05	1.00
	thousand tonnes				
Canada*	226	301	227	117	155
Argentina	18	17	17	16	17
Hungary	8	20	13	13	10
Australia	6	6	6	6	6
Uruguay	3	3	3	3	3
Mexico, Turkey, Spain	2	2	2	2	2
Total Production	**263**	**349**	**268**	**157**	**193**
Carry-in Stocks (e)	20	67	170	190	110
Supply (e)	**283**	**416**	**438**	**347**	**303**
Use (e)	216	246	248	237	233
Carry-out Stocks (e)	67	170	190	110	70
Stocks-to-use ratio (%)	31	69	77	46	30

e: estimate, AAFC, May 2007
f: forecast, AAFC, May 2007
Source: FAO, except *Statistics Canada - May 2007

CANADA

Production

Canary seed is a cool season crop which prefers long warm days and cool nights. It is well suited to the Canadian prairies and matures in approximately 100 days. Canary seed is shallow rooted and is more sensitive to heat and less drought tolerant and salt tolerant than wheat. It does best on heavy clay or clay loam, moisture retentive soils. Canary seed should be planted as early in May as possible. Late seeding can lead to delayed maturation of the straw during harvest. Canary seed is shatter resistant, which allows it to be straight combined. If the crop is swathed, it should not be cut until it has reached full maturity and should be combined soon after swathing. Caution should be taken to keep dehulling to a minimum, since dehulled seed is classified as dockage and must be cleaned out. Canary seed with the hull intact is shiny and golden yellow. Dehulled canary seed is dark brown in

colour. Canary seed can be stored for long periods of time without losing quality, provided it is put into storage in good condition. Canadian canary seed is normally harvested in September and early October.

Canadian canary seed production during the past ten years has been extremely variable, ranging from 114,000 t in 2001-2002 to 301,000 t in 2004-2005. Canada's share of world production increased during this period as production in Argentina and Hungary decreased. Canary seed production has become concentrated in Saskatchewan, which accounted for 96% of Canadian production in 2006-2007. The remainder was produced in Manitoba and Alberta.

Uses

Canary seed has only one market at the present time, as a major component in seed mixtures for pet and wild birds. Typically it is mixed with seeds such as millet, sunflower seed, safflower seed, Nyjer seed, buckwheat, cereal grains, flaxseed, and canola.

Marketing

All of the canary seed produced in Canada is sold on the open market to dealers. Canary seed going to customers in Canada and the US is shipped bulk in trucks or in containers which are carried by trucks or trains. Canary seed going to northern Europe is usually shipped bulk, whereas canary seed going to customers in southern Europe and other parts of the world is usually shipped in containers. Some canary seed is grown under production contracts, which guarantee a price for part of the production, but most is sold on the spot market.

The Canadian Special Crops Association (CSCA) *(www.specialcrops.mb.ca)* establishes trade rules for domestic trade and serves as a forum for exporters, dealers and brokers involved in trading Canada's pulse and special crops, including canary seed. The website includes a section where buyers can submit a request for prices.

CANARIO

Canario is a glabrous or hairless type of canary seed developed in Canada, with first commercial production starting in 1997. Traditional canary seed has tiny hairs at the base of the seed that break off and cause severe itching to producers, processors, and packagers. Canario eliminates that problem. Canario also helps the industry through reduced shipping costs due to 12% greater seed packing per container and the elimination of the oiling and polishing steps in processing.

The Canadian Special Crops Association (CSCA) has obtained registration for the trademark Canario in Canada, European Union, Mexico, the US and Brazil. Canario varieties must be 97% glabrous in order to bear the Canario trademark. The Canadian Grain Commission (CGC) has developed a Canario Seed Analysis Certificate to be used for shipments of canary seed which meet the Canario standard.

CANADA: CANARY SEED SUPPLY AND DISPOSITION

crop year *August - July*	2003 -2004	2004 -2005	2005 -2006	2006 -2007f	2007 -2008f
Seeded Area (kha)	251	356	190	119	170
Harvested Area (kha)	243	318	186	115	161
Yield (t/ha)	0.93	0.95	1.22	1.02	0.96
	thousand tonnes				
Carry-in stocks	20	67	168	190	110
Production	226	301	227	117	155
Supply	**246**	**368**	**395**	**307**	**265**
Exports					
Europe	*51*	*51*	*57*	*56*	*56*
Central America	*35*	*43*	*58*	*50*	*51*
South America	*48*	*45*	*46*	*45*	*46*
United States	*20*	*16*	*14*	*14*	*14*
Middle East & Africa	*6*	*4*	*5*	*5*	*4*
Asia & Oceania	*5*	*4*	*5*	*5*	*4*
Total Exports	165	163	185	175	175
Domestic Use	14	37	20	22	20
Total Use	**179**	**200**	**205**	**197**	**195**
Carry-out Stocks	**67**	**168**	**190**	**110**	**70**
Stocks-to-use ratio (%)	37	84	93	56	36
Seeded Area (kac)	620	880	469	294	420
Yield (lb/ac)	830	845	1,089	908	859
Average producer price					
$/t	345	230	195	325 -355	360 -390
$/lb	0.156	0.104	0.088	0.147 -0.161	0.163 -0.177

f: forecast, Agriculture and Agri-Food Canada, May 2007
Source: Statistics Canada and AAFC

The Canaryseed Development Commission of Saskatchewan was formed in 2006 with a vision of improving canary seed profitability through increased market diversity and crop innovation. Its primary objectives are to co-ordinate research and expand the market for canary seed for the benefit of producers and other stakeholders. The commission is funded by a refundable check-off of $1.75 per tonne (/t) on Saskatchewan-grown canary seed sales. The check-off will allow growers to have more control over future developments in the canary seed crop. Currently, the money is used for plant breeding and agronomic research and for the start-up phase of a new uses for canary seed project.

Canary seed is not designated as a grain by the Canadian Grain Commission (CGC) pursuant to the Canada Grain Regulations. Furthermore, grades have not been established for canary seed. Producers who deliver canary seed to dealers or elevator operators licensed by the CGC are not entitled to make a claim against the security tendered by holders of licences if they fail to pay for canary seed.

Export specifications for canary seed are usually minimum 99% pure seed, with a maximum of 4% dehulled seed.

Domestic Use

Canadian domestic use, which includes bird seed, seed and dockage, accounts for about 10% of total use. Canary seed is mixed with other seed for bird seed by processors located in western and central Canada, and sold under their own brands or under customized store brands.

Exports

Canadian exports of canary seed are mainly in the bulk,

unprocessed form, although packaged seed mixtures are also exported. Exports have been variable, ranging from 122,000 t to 185,000 t per year, but with an upward trend during the past ten years. The western hemisphere and Europe are the main destinations for Canadian canary seed, although it is exported throughout the world. The main importing countries are Mexico, Belgium, Brazil, US, Spain, Colombia and Venezuela. Although Canada is the dominant exporter, it has competition from Argentina in Brazil and from Hungary in the European Union.

Prices

Canadian prices are determined on an export basis because Canada exports about 90% of its canary seed production. Prices are, therefore, highly sensitive to the value of the Canadian dollar in foreign markets. Since there are no futures markets for canary seed, prices are negotiated between the producer, dealer and customer based on supply and demand factors. The prices negotiated could be for immediate or future delivery. The average producer price has been volatile, depending on supply, ranging from $195 to $660/t during the past ten years.

WORLD: CANARY SEED EXPORTS

calendar year	2002	2003	2004	2005	2006
	thousand tonnes				
Canada*	146	164	153	175	187
Belgium	9	6	3	4	11
United States	11	8	11	13	6
Hungary	8	4	6	5	6
Argentina	12	9	9	5	4
Netherlands	5	3	5	4	3
Other	5	4	4	4	4
Total	**196**	**198**	**191**	**210**	**221**

Note: Exports from the US, Belgium and Netherlands, and part of the volume listed under other are re-exports.

WORLD: CANARY SEED IMPORTS

calendar year	2002	2003	2004	2005	2006
	thousand tonnes				
Mexico	51	49	48	50	57
Brazil	33	33	34	31	33
Belgium	24	22	28	24	27
Spain	12	14	12	13	15
United States	20	23	18	15	14
Italy	10	9	11	11	11
Colombia	5	9	7	9	8
Netherlands	4	2	8	5	8
United Kingdom	5	5	4	7	5
Venezuela	5	3	4	6	4
Peru	3	3	4	5	5
Portugal	4	4	5	3	5
Chile	4	4	3	4	4
Germany	3	3	2	4	4
France	3	3	3	3	3
Greece	1	2	2	2	2
Taiwan	1	2	2	1	2
Malta	2	1	2	1	2
Japan	1	2	1	1	2
Algeria	2	2	2	1	1
China	1	2	2	1	1
Indonesia	2	2	1	1	1
Guatemala	1	1	1	1	1
Lebanon	1	1	1	1	1
Other	8	8	9	10	9
Total	**206**	**209**	**214**	**210**	**225**

Source: FAO, Global Trade Atlas and * which is Statistics Canada, May 2007

OUTLOOK

World: 2007-2008

Production is forecast to increase by 23%, from 2006-2007 to 193,000 t, because of higher production in Canada. Supply is forecast to decrease by 13% to 303,000 t due to lower supply in Canada. Use is expected to decrease by 2% due to higher prices and carry-out stocks are expected to decrease further, with a stocks-to-use ratio of 30%.

Canada: 2007-2008

Area seeded is expected to increase by 43% from 2006-2007 due to higher prices and lower carry-in stocks. Assuming normal abandonment and trend yields, production is forecast to increase by 32% to 155,000 t. Supply is forecast to decrease by 14% to 265,000 t as sharply lower carry-in stocks more than offset the increase in production. Exports are forecast to remain stable and carry-out stocks are expected to decrease further, with a stocks-to-use ratio of 36%. The average price is forecast to increase from 2006-2007 because of the lower supply. The main factor to watch is precipitation during the growing and harvest periods.

Canada: Longer Term

Canario offers opportunities for food and industrial uses. However, at the present time, Canario cannot be used for human consumption and it will require human trials before it can be approved by Health Canada for food use.

Researchers have established that Canario groats (dehulled seed) have a protein content of about 19%, which is significantly higher than for wheat and other cereal grains and is close to pulse crops. Canario's oil content is about 9%, about four times as high as for wheat. The oil is made up of 32% oleic and 54% linoleic fatty acids, a desirable composition for human consumption. Prolamin and glutelin are the main storage proteins in canary seed, constituting 78% of total proteins. Canary seed protein is high in cystine, tryptophan and phenylalanine, but low in lysine and threonine. It would be a good supplemental protein source for dairy proteins, such as casein and whey proteins. Its starch content is similar to wheat, at about 61%. Canario has high lipid content, which could be a valuable by-product. The presence of antioxidant activity in Canario lipid could be a delaying factor in the rancidity of Canario products during storage. Canario starch comprises small polygonal granules, smaller than commercially available starches. It was found to form a rigid gel which was stable under cooling and freezing conditions.

Potential uses for Canario have been identified but none have been realized yet. Canario can be separated into starch, protein, oil and fibre by wet milling. It has the potential for use as a fat substitute because the oil is high in unsaturated fat. Canario's starch properties could make it suitable for use in the cosmetics industry or as an industrial dusting starch. Canario could be roasted and used as a low fat substitute for sesame seed in bread and snack food. The flour can be used in baking wheat-Canario and multi-grain bread and cookies.

The use of Canario for food and industrial products is expected to encourage premium pricing for Canario compared to traditional canary seed. It would also

SASKATCHEWAN: CARAWAY SEED										
crop year (August – July)	**1997 -1998**	**1998 -1999**	**1999 -2000**	**2000 -2001**	**2001 -2002**	**2002 -2003**	**2003 -2004**	**2004 -2005**	**2005 -2006**	**2006 -2007f**
Seeded Area (kha)	5.0	4.8	4.0	8.1	6.1	8.1	8.1	4.0	4.0	2.0
Harvested Area (kha)	4.4	3.5	4.0	7.3	4.1	6.1	6.1	4.0	3.2	1.6
Yield (t/ha)	0.59	0.60	0.85	0.75	0.32	0.39	0.52	0.63	0.34	0.56
Production	2.6	2.1	3.4	5.5	1.3	2.4	3.2	2.5	1.1	0.9
Average Price ($/t)	770	680	730	990	1,450	1,450	880	790	660	640
Canadian Exports (kt)	1.6	2.8	3.8	2.5	2.5	2.0	2.3	2.2	2.1	1.7

SASKATCHEWAN: CORIANDER SEED										
crop year (August – July)	**1997 -1998**	**1998 -1999**	**1999 -2000**	**2000 -2001**	**2001 -2002**	**2002 -2003**	**2003 -2004**	**2004 -2005**	**2005 -2006**	**2006 -2007f**
Seeded Area (kha)	8.8	10.1	8.1	6.1	6.1	8.1	8.1	12.1	10.1	8.1
Harvested Area (kha)	8.5	10.1	8.1	6.1	6.1	7.3	8.1	10.1	9.3	8.1
Yield (t/ha)	0.62	0.93	0.88	0.66	0.66	0.71	0.59	0.78	0.96	1.16
Production	5.3	9.4	7.1	4.0	4.0	5.2	4.8	7.9	8.9	9.4
Average Price ($/t)	730	460	370	380	510	570	570	440	350	330
Canadian Exports (kt)	3.8	4.2	4.5	4.8	3.8	3.1	5.6	4.9	5.6	5.6

f: forecast, Agriculture and Agri-Food Canada, May 2007
Source: Statistics Canada, Saskatchewan Agriculture and Food, and AAFC

increase demand for Canadian canary seed significantly. This in turn would result in increased economic diversification through the replacement of traditional crops and through the development of new processing opportunities for food and industrial uses.

SPICE CROPS

Canadian spice crops production is concentrated in Saskatchewan, with smaller volumes produced in Manitoba and Alberta. The main spice crops produced in Canada are caraway seed and coriander seed, but small amounts of fenugreek seed and dill seed are also produced.

Spice crops can also include mustard seed, but this crop is much larger in production volume and will be covered in a separate *Bi-weekly Bulletin*.

Seed from spice crops is used to add flavour to food. Caraway seed is used to flavour such foods as bread, cheese and sauerkraut. Coriander seed is used to flavour products such as curries, gin and prepared meats.

Caraway seed produced in Canada is usually from biennial varieties which require a second growing season to produce seed. Although annual varieties are available, they are lower yielding and late maturing, which increases the risk of frost damage. Coriander seed is an annual crop.

Data on the world production of caraway seed and coriander seed are not available. Caraway seed is produced mainly in northern Europe, India, the US and Canada. Coriander seed is produced mainly in countries along the Mediterranean and Black seas, Argentina, India and Canada.

Data on production in Canada for caraway seed and coriander seed are only available for the main producing province, Saskatchewan. Production of both crops in Saskatchewan has been variable, in line with variable seeded area, crop abandonment and yields. Spice crops are sometimes grown under production contracts. Average prices have also varied due to production variability in Canada and other producing countries.

The US is the only significant destination for Canadian caraway seed. The US is also the main destination for coriander seed, with other significant destinations being the United Kingdom, Sri Lanka, Japan and Morocco.

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